

## GREENHOUSE CROP PRODUCTION & ENGINEERING DESIGN SHORT COURSE

### MARCH 2, MORNING

7:00 am Registration  
8:00 – 8:15 am **Welcome and Introductions**, Dr. Murat Kacira, Director, UA-CEAC

### FUNDAMENTALS OF HYDROPONICS & CONTROLLED ENVIRONMENT AGRICULTURE (CEA)

8:15 – 9:00 am **Controlled Environment Greenhouse and Hydroponics – Limitless Opportunity**  
Dr. Merle Jensen, Professor Emeritus, School of Plant Sciences, The University of Arizona,  
Founder of the UA-CEAC in 2000

9:00 – 9:45 am **Hydroponics, Medium Composition & Delivery Systems**  
Myles Lewis, MS, Owner, Arizona Vegetable Company & Instructor, CEAC Intensive Workshop

9:45 – 10:00 am Discussion of Previous Lectures, Q&A

10:00 - 10:30 am Coffee Break and Networking at Exhibitor Gallery

10:30 - 11:15 pm **Greenhouse Structures- Glazing & Environmental Control**  
Dr. Gene Giacomelli – Professor, Biosystems Engineering, The University of Arizona,  
Greenhouse Extension Specialist, CALS

11:15 - 12:00 pm **Managing Plant Nutrition for Quality Crop Production**  
Dr. Stacy Tollefson – Professor of Practice, Biosystems Engineering, The University of Arizona  
Instructor, CEAC Tomato Intensive Workshop

12:00 - 1:00 pm Lunch Provided- Eating and Networking Opportunity

### MARCH 2, AFTERNOON

### INTEGRATED PEST MANAGEMENT

1:00 – 1:45 pm **Biotech: Tissue Culture Procedures & Its Value added to the CEA Market**  
Dr. Hope Jones, Founder & CEO, Emergent Cannabis Sciences

1:45 – 2:30 pm **Scouting for Pests and Insects**  
Karin Tiffit- Consultant, Greenhouse Vegetable Consultants, LLC

2:30 – 2:45 pm Discussion of Previous Lectures, Q&A

2:45 – 3:15 pm Coffee Break and Networking at Exhibitor Gallery

3:15 – 3:30 pm 3, 5 Minute Exhibitor Presentations

3:30 – 4:15 pm **Pest and Disease Identification**  
Dr. Stacy Tollefson, Professor of Practice, Biosystems Engineering, The University of Arizona

4:15 – 5:00 pm **Pest Control Strategies**  
Dr. Stacy Tollefson, Professor of Practice, Biosystems Engineering, The University of Arizona

5:00 – 5:30 pm Discussion of Previous Lectures

6:00 – 7:30pm Welcome Reception – Fueled by appetizers & cash bar  
6:30 pm **CEAC Mission Award Presentation**

**MARCH 3, MORNING**

7:00am Breakfast provided- Eating and Networking Opportunity

**ENGINEERING CONSIDERATIONS & OPTIMAL SYSTEMS DESIGN AND MANAGEMENT**

7:55 – 8:00 am Welcome & Announcements

8:00 – 8:45 am **Monitoring Your Greenhouse Environment: Simple Tools to Technology Trends**  
Dr. Murat Kacira – Professor, Biosystems Engineering, The University of Arizona

8:45 – 9:30 am **Smart Sensing and Environmental Control in CEA**  
Dr. Tharindu Weeraratne, Autogrow

9:30 – 9:45 am Discussion of Previous Lectures – Q&A

9:45 – 10:00 am 3, 5-minute Exhibitor presentations

10:00 – 10:30 am Coffee Break and Networking

10:30 – 11:15 am **Advances in Vertical Farming Design and Strategies**  
Dr. Joel Cuello, Professor, Biosystems Engineering, The University of Arizona

11:15 – 12:00 pm **Greenhouse Energy Conservation Practices**  
Dr. Gene Giacomelli – Professor, Biosystems Engineering, The University of Arizona

12:00 – 12:15 pm Discussion of Previous Lectures – Q&A

12:15 – 1:15 pm Lunch Provided- Eating and Networking Opportunity

**MARCH 3, AFTERNOON**

**FERTIGATION REQUIREMENTS**

1:15 – 2:00 pm **Recirculation, Microbial Issues, and Treatment Systems**  
Dr. Rosa Raudales, Assistant Professor of Horticulture and  
Greenhouse Extension Specialist, University of Connecticut

2:00 – 2:45 pm **Design, Monitoring and Control of Recirculating Nutrient Delivery Systems**  
Dr. Gene Giacomelli – Professor, Biosystems Engineering, The University of Arizona

2:45 – 3:00 pm Discussion of Previous Lectures – Q&A

3:00 – 3:15 pm 3, 5-minute Exhibitor presentations

3:15 – 3:45pm Coffee Break, Visit Exhibit

3:45 – 4:30 pm **Nutrient Programs based on Analyses of Water, Nutrient Solutions, & Plant Tissue**  
Dr. Rosa Raudales, Assistant Professor of Horticulture and  
Greenhouse Extension Specialist, University of Connecticut

4:30 – 5:15 pm Discussion of Previous Lectures– Q&A

Dinner – On Your Own

**MARCH 4, MORNING**

7:00am Breakfast provided

**ALTERNATIVE PRODUCTS IN CEA**

7:55 – 8:00 am Welcome & Announcements

8:00 – 8:45 am **Hemp in CEA**  
William Artwohl, West Coast Greenthumbs

8:45 – 9:30 am **Mushrooms in CEA**  
Dr. Barry Pryor, Professor, School of Plant Sciences, The University of Arizona

9:30 – 9:50 am Discussion of Previous Lectures - Q&A

9:50 – 10:15 am Coffee Break and Networking

10:15 – 11:00 am **Strawberries in CEA**  
Myles Lewis, MS, Owner, Arizona Vegetable Company  
Instructor, CEAC Lettuce Intensive Workshop

11:00 – 11:45 pm **Edible Insects Production in CEA Systems**  
Dr. Goggy Davidowitz, Associate Professor, Department of Entomology, Ecology and  
Evolutionary Biology, The University of Arizona

11:45 – 12:00 pm Discussion of Previous Lectures, Q&A

12:00 – 1:00 pm Lunch Provided- Eating and Networking Opportunity

**MARCH 4, AFTERNOON**

**EMERGING TRENDS AND TECHNOLOGY IN CEA [with Speakers from the CEA Industry]**

1:00 – 1:25 pm **Soilless Substrates and Their Enhancements**  
Jose Chen-Lopez, Premier Tech Horticulture

1:25 – 1:50pm **Optimizing production Quality and Yields Through Plant-Centric Automated Environmental Controls**  
Artem Efremov, Application Service Expert, Argus Controls

1:50 – 2:15 pm **Introduction of LED Lighting Technology for Horticulture Applications**  
Dr. Fei “Jeff” Jia, Technical Solutions Manager, Heliospectra

2:15 – 2:45 pm Discussion of Previous Lectures- Q&A

2:45 – 3:00 pm 3, 5 Minute Exhibitor presentation

3:00 – 3:25 pm Coffee Break, Visit Exhibits

3:25 – 3:50 pm **Hydroponic Crop Production Systems - Design, Applications, and Operation**  
Jenny Harris - CEO, and Joe Swartz - Vice President, American Hydroponics (AmHydro)

3:50 – 4:15 pm Discussion of Previous Lecture – Q&A

Dinner – On Your Own

**MARCH 5, ALL DAY!**

7:00am Breakfast provided

**Hands on workshops at CEAC:**

8:00am Depart hotel for CEAC [Bus provided or drive self]  
[1951 E. Roger Road Tucson, AZ 86719]

8:30 – 10:00 am ROUND 1

10:00 – 11:30 am ROUND 2

11:30 – 1:00 pm Lunch in the CEAC Classroom & Yard

1:00 – 2:30 pm ROUND 3

2:45 – 4:00 pm ROUND 4

4:00 – 5:00pm Additional Round

5:00pm Return to Hotel

**Titles of Workshops:**

High Wire Tomato Production-

Fertigation Systems-

Hydroponic Leafy Greens Production-

Sensors & Controls with Vertical Farm Tour-

Specialty Mushroom Production-

**MARCH 6**

**COMMERCIAL GH TOUR [additional registration and fee required]**

8:30am Departing from Hotel [Bus provided or drive self]

9:00am-11:00am Tour of Merchant Gardens  
[555 S Tucson Blvd Tucson, AZ 85716]

11:00am Return to Hotel - box lunch will be provided